

INTERNATIONAL STANDARD



**Boxes and enclosures for electrical accessories for household and similar fixed electrical installations –
Part 21: Particular requirements for boxes and enclosures with provision for suspension means**



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**Boxes and enclosures for electrical accessories for household and similar fixed electrical installations –
Part 21: Particular requirements for boxes and enclosures with provision for suspension means**

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COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**BOXES AND ENCLOSURES FOR ELECTRICAL ACCESSORIES FOR
HOUSEHOLD AND SIMILAR FIXED ELECTRICAL INSTALLATIONS –****Part 21: Particular requirements for boxes and
enclosures with provision for suspension means**

FOREWORD

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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 60670-21:2004+AMD1:2016 CSV. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC 60670-21 has been prepared by subcommittee 23B: Plugs, socket-outlets and switches, of IEC technical committee 23: Electrical accessories. It is an International Standard.

This second edition cancels and replaces the first edition published in 2004 and Amendment 1:2016. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) Complete revision of the tests and requirements of the suspension means.

The text of this International Standard is based on the following documents:

Draft	Report on voting
23B/1534/FDIS	23B/1552/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 60670 series, published under the general title *Boxes and enclosures for electrical accessories for household and similar fixed installations*, can be found on the IEC website.

This document is to be used in conjunction with IEC 60670-1:2024. It lists the changes necessary to convert that standard into a specific standard for housing protective devices and other power dissipating electrical equipment.

Where this document states "addition", "modification" or "replacement", the relevant requirement, test specifications or explanatory matter in IEC 60670-1:2024 shall be adapted accordingly.

Clauses and subclauses, notes, figures or tables which are additional to those in IEC 60670-1:2024 are numbered starting from 101.

Additional annexes to IEC 60670-1:2024 are numbered AA, BB, etc.

In this publication the following print types are used:

- requirements proper: in roman type.
- *test specifications: in italic type.*
- notes: in smaller roman type.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

BOXES AND ENCLOSURES FOR ELECTRICAL ACCESSORIES FOR HOUSEHOLD AND SIMILAR FIXED ELECTRICAL INSTALLATIONS –

Part 21: Particular requirements for boxes and enclosures with provision for suspension means

1 Scope

Clause 1 of IEC 60670-1:2024 is applicable with the following modification:

Addition after the ~~fourth~~ third paragraph:

This document applies to boxes and enclosures for ceiling and wall mounting with provision for suspension means.

2 Normative references

Clause 2 of IEC 60670-1:2024 is applicable.

3 Terms and definitions

Clause 3 of IEC 60670-1:2024 is applicable with the following modification:

Addition:

3.101

box with provision for suspension means

box intended to be used for suspending and supporting mechanical loads and which accepts the suspension means

3.102

suspension means

means comprising any necessary components (hooks, brackets, etc.) which may be delivered with the box and enclosure or supplied separately ~~(see Figure 101)~~

Note 1 to entry: Examples of suspension means are shown in Figure 101.

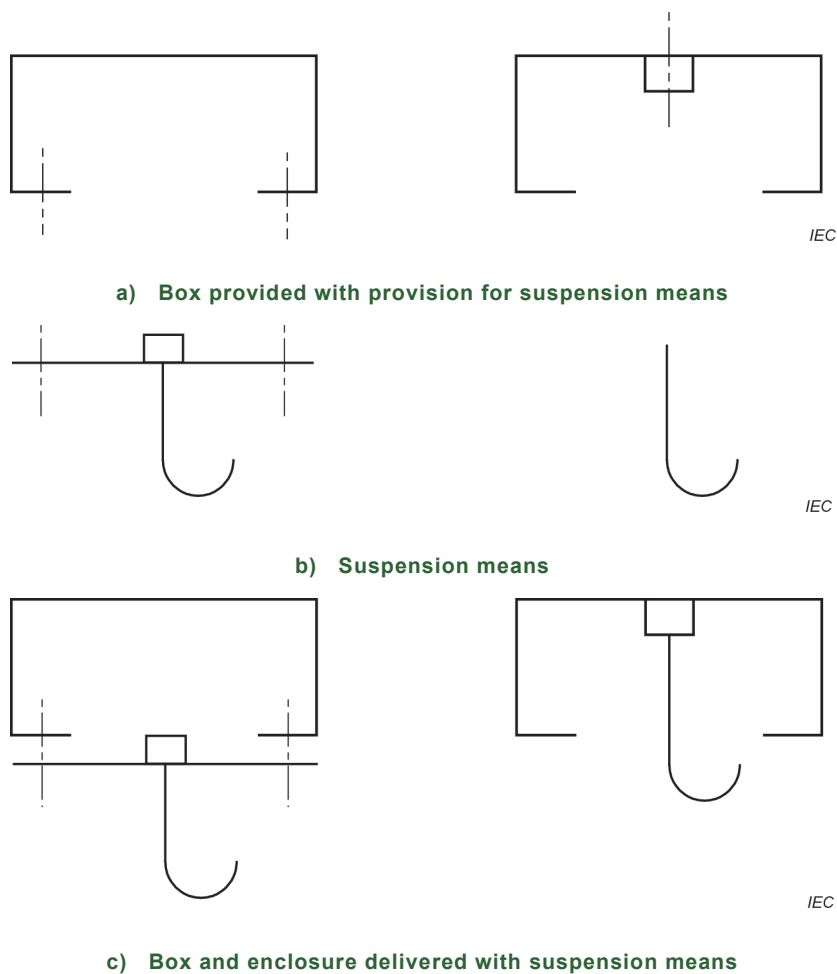


Figure 101 – Examples of suspension means

4 General requirements

Clause 4 of IEC 60670-1:2024 is applicable.

5 General ~~notes~~ remarks on tests

Clause 5 of IEC 60670-1:2024 is applicable.

6 Ratings

Void.

7 Classification

Clause 7 of IEC 60670-1:2024 is applicable with the following modification:

Addition to Table 1:

7.101 The provision for suspension means ^{aab}	7.101.1 For suspension of supporting a luminaire.
	7.101.2 For suspension of supporting a ceiling fan.
^{aab} The suspension means may be provided with the box or not.	

8 Marking

Clause 8 of IEC 60670-1:2024 is applicable with the following modification:

8.1 General

~~Addition after item j):~~

~~k) the mass in kg, if the test force declared by the manufacturer is greater than 250 N for boxes and enclosures classified according to 7.101.1.~~

~~NOTE 1 In the following countries boxes for luminaire support are marked "For luminaire support". Where boxes are intended to support a mass greater than 15,8 kg, the mass is to be marked: US.~~

~~NOTE 2 In Denmark shall the marking in kg reflect a safety factor of 5 times.~~

Addition after item k):

l) for boxes and enclosures classified according to 7.101.1, the maximum supported mass in kilograms declared by the manufacturer.

NOTE 101 In the following countries boxes for luminaire support are marked "For luminaire support". Where boxes are intended to support a mass greater than 15,8 kg, the mass is to be marked: US.

NOTE 102 In the following country the marking in kilograms shall reflect a safety factor of 5 times: DK.

9 Dimensions

Clause 9 of IEC 60670-1:2024 is applicable.

10 Protection against electric shock

Clause 10 of IEC 60670-1:2024 is applicable with the following modification:

Addition:

Conductive parts of suspension means inside the box or enclosure shall be:

- protected by a layer of insulating material which complies with the tests for insulating linings, or
- located such that it will not come in contact with electrical conductors or live parts, or
- reliably connected to the earthing means complying with requirements of 11.1 when fitted as for normal use.

11 Provision for earthing

Clause 11 of IEC 60670-1:2024 is applicable.

12 Construction

Clause 12 of IEC 60670-1:2024 is applicable with the following modification:

Addition:

12.101 Provision for suspension means

Unless otherwise declared by the manufacturer, screws for fixing accessories and/or covers are not considered as provision for suspension means.

12.102 Minimum mass to be supported by suspension means

Boxes and enclosures with provision for suspension means shall be able to support a mass of at least 5 kg.

NOTE For fixing means of a luminaire, a minimum supported mass of 5 kg is given in IEC 60364-5-55:2011, 559.5.2.

Compliance is checked by the tests of 15.101.

13 Resistance to ageing, protection against ingress of solid objects and against harmful ingress of water

Clause 13 of IEC 60670-1:2024 is applicable.

14 Insulation resistance and electric strength

Clause 14 of IEC 60670-1:2024 is applicable.

15 Mechanical strength

Clause 15 of IEC 60670-1:2024 is applicable with the following modification:

Addition:

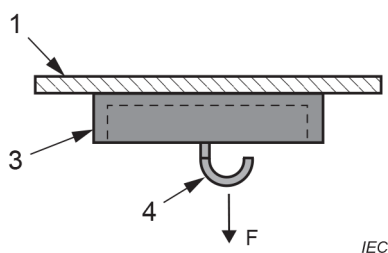
~~4.101~~15.101 Boxes and enclosures with provision for suspension means

15.101.1 Boxes and enclosures with provision for suspension means shall withstand the thermal and mechanical stresses occurring in normal use.

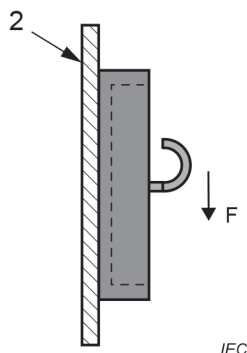
Boxes and enclosures with provision for suspension means according to:

- 7.101.1 shall comply with the requirements of 15.101.~~42~~ and 15.101.~~23~~;
- 7.101.2 shall comply with the requirements of 15.101.~~34~~.

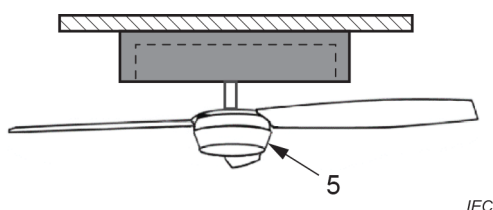
Examples of boxes and enclosures with provision for suspension means are shown in Figure 102.



a) Boxes and enclosures which are intended for suspension of loads from a ceiling.



b) Boxes and enclosures which are intended for suspension of loads from a wall



c) Boxes and enclosures which are intended to support a ceiling fan

Key

- 1 ceiling
- 2 wall
- 3 box
- 4 suspension mean
- 5 ceiling fan

Figure 102 – Examples of boxes and enclosures with provision for suspension means

15.101.42 Boxes and enclosures which are intended for suspension of loads from a ceiling shall withstand a test force of 250 N or a higher test force ~~Y~~ *X* corresponding to five times the maximum supported mass in kilograms declared by the manufacturer.

The test force *F* in newtons is the result of the maximum supported mass in kilograms multiplied by the gravity and multiplied by a safety factor of 5; this value is rounded up to the next decimal, for example: $5 \text{ kg} \times 9,81 \text{ m/s}^2 \times 5 \approx 245$, gives a test force of 250 N.

NOTE 4 101 In the following countries there is no requirement for all boxes and enclosures for suspension means to withstand 250 N and no requirement for non-metallic boxes and enclosures to withstand 90 °C: UK.

NOTE 2 102 In the following country, the test force *Y* shall correspond to 5 times the marking in kilograms as required in item k) of 8.1: DK

NOTE 3 103 In Spain, there are no requirements for all boxes and enclosures for suspension means to withstand 90 °C.

Compliance is checked by the following test.

The specimen is fitted with a suspension means and installed as for normal use according to the manufacturer's instructions, any screw being tightened to two-thirds of the torque given in the relevant column of Table 4.

Greater values of torque may be used if so declared by the manufacturer, when the relevant information is provided.

~~The suspension means is then loaded with a weight of (250 ± 5) N or with a weight $(Y \pm 2 \%)$ N declared by the manufacturer, whichever is the higher, for 24 h.~~

~~For boxes and enclosures according to 7.1.1 and 7.1.3 the test is performed in a heating cabinet at $(90 \pm 2)^\circ\text{C}$.~~

~~For boxes and enclosures according to 7.1.2 and 7.1.4 the test is performed at ambient temperature.~~

A test force of (250 ± 5) N, or of $(X \pm 2 \%)$ N, is applied to the suspension means for 24 h at ambient temperature.

For boxes and enclosures according to 7.1.1 and 7.1.3 the test is repeated in a heating cabinet at $(90 \pm 2)^\circ\text{C}$ for 1 h with a test force of (50 ± 1) N, or a higher test force corresponding to the mass declared by the manufacturer without considering the safety factor.

NOTE 4104 In the following country the test of this Subclause 15.101.2 shall be carried out at $(80 \pm 2)^\circ\text{C}$ instead of $(90 \pm 2)^\circ\text{C}$: NL.

During the test, the box and the enclosure or the suspension means shall not become detached and the specimen shall show no damage which leads to non-compliance with this document.

15.101.23 Boxes and enclosures which are intended ~~to be used in or on~~ for suspension of loads from a wall shall withstand a test force of 100 N or a higher test force Y corresponding to two times the maximum supported mass in kilograms declared by the manufacturer.

NOTE 1 ~~This means may be screws otherwise intended for fixing a part of the box, for example the cover or cover plate.~~

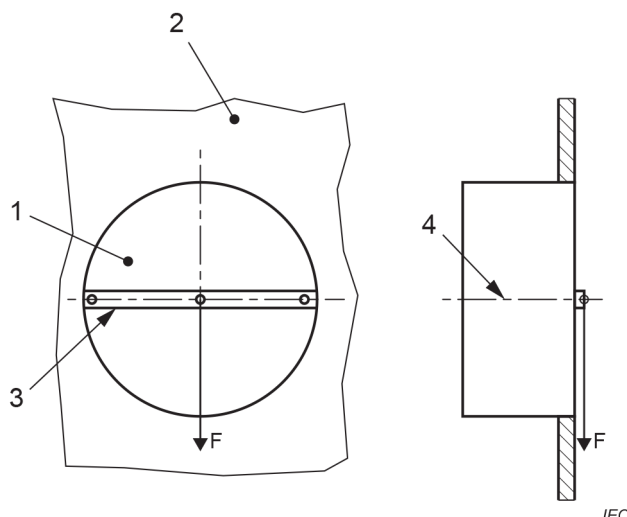
NOTE 2 In the following countries there is no requirement for all suspension means to withstand 100 N: UK.

Compliance is checked by inspection and by the following test.

The box or the enclosure including covers and cover plates (if any) shall be installed as for normal use according to the manufacturer's instructions and shall be placed in a heating cabinet, any screw being tightened to two-thirds of the torque given in the relevant column of Table 4.

~~A force, equally distributed between each means if more than one, of (100 ± 5) N or of $(Y \pm 2 \%)$ N declared by the manufacturer, is then applied for 24 h at $(40 \pm 2)^\circ\text{C}$ perpendicularly to the wall.~~

A force, equally distributed between each means if more than one, of (100 ± 2) N or of $(Y \pm 2 \%)$ N is then applied for 24 h at $(40 \pm 2)^\circ\text{C}$ downward at a distance not exceeding 5 mm protruding from the plane formed by the mounting surface of the luminaire as shown in Figure 103.



Key

- 1 test specimen
- 2 sheet of plywood
- 3 lever
- 4 main axis of the box

Figure 103 – Verification of suspension means intended to be used on a wall

During the test, the box or enclosure or the suspension means shall not become detached and the specimen shall show no damage which leads to non-compliance with this document.

15.101.34 Boxes and enclosures which are intended to support a ceiling fan shall withstand the thermal and mechanical stress occurring in normal use.

During the test the box or enclosure or its supporting means shall not be pulled loose from the test structure when subjected to the following tests.

One specimen shall be tested in each of the horizontal and inclined positions.

A specimen shall be mounted in accordance with the manufacturer's instructions to a supporting test structure so as to be tested while both in a horizontal position and inclined 30° from the horizontal with the mounting screws perpendicular to the ceiling and the fan blades parallel to the floor (see ~~Figure 102~~ Figure 104).